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Research Topic:

"DOCUMENTATION AND STUDIES ON SOME ETHNOVETERINARY MEDICINAL PLANT SPECIES OF NANDED DISTRICT"

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1. INTRODUCTION:

Ethnoveterinary medicine is a system which is based on folk beliefs, traditional knowledge, skills, methods, and practices used for curing diseases and maintaining health of animals. Ethnoveterinary medicine provides the major source for the livestock disease treatment throughout the world even today. Humans have used herbal remedies for curing different diseases for their domesticated animals since the start of civilization.

Ancient records on animal healthcare are found in *Vedas*, *Puranas* like *Ashwapuranas*, *Garudpuranas* and *Hastipuranas* which devoted to animal husbandry (Jain & Shrivastava, 2003).

The term Ethnoveterinary was introduced by Dr. Constance M. McCorkle. It was first used in her article "An introduction to Ethnoveterinary research and development" that mentioned it to be based on indigenous knowledge that is passed on from generation to generation through verbal verdicts. Ethnoveterinary research is defined as the "Systematic investigation and application of veterinary folk knowledge, theory and practice" (Mc Corkle, 1986).

Traditional veterinary medicine was experienced in early 1800 B.C. at the time of a Babylon King Hammurabi who devised laws on veterinary fees and charged for treating animals (Veen, 1996). In recent time, there has been marked shift towards herbal cures because of the definite collective and irreversible reaction of modern drugs (Pande *et al.*, 2007).

In South India, many livestock owners, especially those who are poor and live in remote areas, use ethnoveterinary medicine (EVM) for the primary healthcare of their animals. The livestock owners in India have been using traditional medication based on plant formulations since time immemorial. The unique advantage is that India is one of the world's 12 mega – diversity countries accounting for 8% of global plant genetic resources and higher share of microorganisms (Balakrishnan *et al*., 2009).

The medicinal plants have been widely used as a primary source of prevention and control of livestock diseases for several centuries. Traditional veterinary medicine knowledge like all other traditional knowledge systems is handed down orally from generation to generation and it may disappear because of rapid socio - economic, environmental and technological changes and as a result of the loss of cultural heritage.

Now a time, the young generation is not showing interest in preserving this knowledge therefore, it becomes essential to document it and conserve through systematic studies before it is lost forever.

Marathwada was a part of Nizam's domain, which later, transferred from Hyderabad state to Bombay state. On May 1, 1960, Marathwada became a part of Maharashtra state of India. Marathwada comprises of eight districts.

The District of Nanded lies between 18^0 15' to 19^0 55' North latitudes and 77^0 to $78^0$25' East longitudes. It is located in the south eastern part of the state. It is bounded on the North by Yavatmal District, on the South West by Latur District, on the West by Parbhani Distirct, on North-West by Hingoli district of Maharashtra State, on the East and South-East by Adilabad and Nizamabad Districts of Telangana State and on the South by Bidar District of Karnataka State. The area presents undulating topography with uneven hills, plateau, gentle slopes and valley planes. Main rivers of district are Godavari, Manjra, Manyad, Penganga etc.

Geographical Area of Nanded District is 10502 Km^2. out of which 11.25% is forest area. There are 16 talukas and 1611 villages in the district. According to 2011 census its population is 3,361,292 of which 72.81% were rural mainly dependant on agriculture. Maintaining and rearing of cattle plays a very important role in agriculture based rural economy as they are useful in agriculture related needs. As per 2003 live stock census there are 13.73 lakhs cattle in the district. There is one veterinary health center at district level and 6 sub veterinary health centers & 103 veterinary dispensaries in the district. This number is very less as compared to total livestock population. To maintain such big population of livestock, ethnoveterinary medicine practice has also been developed. So, most of the farmers & tribal depend on traditional ethnoveterinary medicinal plants as they are cheaper, easily available and effective, especially in rural areas where veterinary services are irregular or absent and expensive. At this level, indigenous animal health systems are used for emergency purposes.

In 2006, the Ministry of Panchayati Raj included Nanded as one of the country's 250 most backward districts (out of a total of 640). It is one of the twelve districts in Maharashtra currently receiving funds from the Backward Regions Grant Fund Programme (BRGF) (Anonymous, 2011). Perhaps, the most neglected region of Maharashtra but it has vast cultural heritage and traditional knowledge about ethno

botany and ethnoveterinary practices. It is urgent need to document such traditional knowledge.

2. REVIEW OF LITERATURE AND DEVELOPMENT IN THE SUBJECT (Previous work done in the relevant area):

In India, vast research has been done on documentation of ethnoveterinary plants but less information is available in the areas such as phytochemical studies and efficacy assessment in association with the ethnoveterinary medicinal plants. Exploration and documentation work has been carried out to bring record of traditional ethnoveterinary knowledge of the Lambani ethnic group in Chitradurga district of Karnataka, Southern India. Total 39 plants belonging to 24 families have been documented in the study for their interesting therapeutic properties in treating various veterinary ailments (Ramachandra *et al*, 2012).

Ethnoveterinary survey of Karimnagar and Warangal districts of Telangana state, India has been carried out for documentation of 68 plant species, belonging to 61 genera of 36 families (Odelu, 2015).

Ramalah (2005) studied 29 ethnoveterinary plant species which were in routine use by various tribal veterinary doctors in Nandurbar district of Maharashtra, India.

Total 41 species of ethnoveterinary medicinal plants belonging to 27 families and 39 genera were documented in the study with the help of nine ethnoveterinary traditional healers from Bhandara district (M.S.) India (Gadpayale *et al.* 2014). Kulkarni *et al.* (2014) carried out field survey in three clusters of Nagpur, Chandrapur and Gadchiroli of Maharashtra state and found that local people were using 46 plants to cure certain veterinary diseases commonly occurring in region and discussed the experience of 60 people (Local farmers and *Vaidus*) in giving plant based herbal drugs and the doses were very effective in treatments. Marathe *et al.* (2010) documented traditional veterinary practices which includes 25 plant species belonging to 19 families used to treat common ailments of livestock population of Khamgaon taluka Dist. Buldhana.

In Marathwada region very little work has been done on documentation of ethnoveterinary medicinal plant species. Salave *et al*. (2011) gave some reports on ethnoveterinary practices in Ashti areas of Beed district. They enumerated about 13 plant species belonging to 11 genera and 9 families used in traditional ethnoveterinary practices by local inhabitants.

Deshmukh *et al.* (2011) documented 36 plant species belongs to 33 families used as unique ethnoveterinary treatments from Dhavda region of Jalna district

No work has been carried out yet based on ethnoveterinary medicinal plants of Nanded district.

3. OBJECTIVES OF RESEARCH/ PROPOSED HYPOTHESIS:

Main objectives of present research work are as follows:

1) To highlight and document the knowledge regarding ethnoveterinary medicinal plants used by farmer and tribal of Nanded district.
2) To screen the selected ethnoveterinary plant species for bioactive compounds which imparts medicinal values to the drug plants
3) To find out antimicrobial efficacy of selected ethnoveterinary medicinal plants.
4) To identify new ethnoveterinary plant species as a source of cheaper and effective veterinary drug for future.

4. METHODOLOGY TO BE ADOPTED:

Phase I: Documentation of ethnoveterinary medicine plant species:

Extensive field survey will be done to document ethnoveterinary medicinal plants which are used by local people, veterinary medicine practitioner and tribal of different parts of Nanded district. A survey sheet/data sheet/enquiry sheet will be carefully prepared for documentation. Fortnightly; sometimes, weekly tours will be organized for visiting the rural as well as tribal areas of the region. Field trips will be made with the local informants to observe the ethnoveterinary plants in nature. Locals or tribal will be interviewed in most formal way. Personal details about informants will be also entered on data sheet. Information like the name (common/vernacular/ local name) of plant, the parts used as ethnoveterinary medicine and the mode of use, dosage and recovery time will be noted down.

The plant species will be collected during the field trips and will bring to laboratory. Species will be identified using Standard floras (Cooke, 1967; Naik 1998; Sharma *et.al*.1996; Singh & Karthikeyan, 2000; Singh *et al.*, 2001).

Herbarium specimens will be prepared and deposited in standard herbarium.

For present research work, 8-10 ethnoveterinary medicinal plant species will be selected having very little or no information about their phytochemical properties. For analysis fresh material as well as dry powder will be used for further studies.

Phase II: Phytochemical studies:

a) **Bioactive compounds**: For evaluation of medicinal properties, plant tissue will be tested qualitatively for various bioactive compounds which include secondary metabolites like **Alkaloids** (Nervous system depressant, Anti-microbial); **Flavonoids** (Antioxidant, Anti-inflamatory, anti-allergic, anticarcinogenic, antiviral and antibacterial); **Tannins** (Anti-carcinogenic, Anti-mutagenic, Anti-microbial and Anti-inflammatory); **Steroids** (Anti-inflammatory); **Saponins** (haemotoxic which exhibits haemolytic property causing haemolysis of erythrocytes) etc. Detection of bioactive compounds will be done by standard prescribed methods (Evans, 1997; Gibbs, 1974; Gupta & Varshney, 1997; Harborne, 1973; Kokate *et al.,* 1998; Kulkarni & Apte, 2000; Peach & Tracey, 1979; Sadasivam & Manikam, 2005; Thimmaiah, 1999).

b) **Ash Analysis:** The plant material will also be screened for ash analysis which includes ash values, qualitative analysis and quantitative estimation of minerals determined by using standard methods (Gupta & Varshney, 1997; Kokate *et al*. 1998, Kulkarni & Apte, 2000; Trivedi & Goel 1984).

Phase III: Evaluation of Antimicrobial activity: Antimicrobial activity of selected ethnoveterinary medicinal plant species will be determined by using standard prescribed methods (Bauer, 1966; Cappuccino & Sherman,1996).

5. IMPORTANCE OF STUDY/SOCIETY APPLICATION:

- **International status:** Ethnoveterinary research and development is still very young, field research has mainly been done in Africa, less in Asia and very little in Latin America and elsewhere. These researches are mainly descriptive (practices, prescriptions, linguistic analyses). Few analytical studies compared the knowledge of pastoralists (sheep or cattle farmer) with epidemiological data on contagious *Caprine pleuropneumonia* has been carried out (Mathias, 1996). A recent bibliographic compilation provides data from 118 countries all over the world regarding 200 health troubles in 25 livestock species (Mathias, 2001). Livestock owners in the rural areas have an excellent traditional knowledge on the use of plants and plant products in the curing of different ailments affecting animals in Ekiti-State, South-Western, Nigeria (Olanipekun and Tedela, 2013). In Ethiopia, people used traditional methods to treat both human and livestock diseases for generations (Tashale and Merga, 2004).

- **National status:** India is enriched with 3000-3500 out of 20,000 medicinal plants all over the world. About 90% of these are found growing wild in different climatic regions of the country (Chopra and Nayar, 1956). India has high diversity of traditional knowledge. Large population of India depend on herbal medicine for human health and ethnoveterinary practices (Dubey *et al.* 2004). Several medicinal herbs are flourishing in Sikkim (Bharati *et al*. 2009) and Tamil Nadu (Balakrishnan *et al*. 2009) which has been in constant use by local inhabitants in serving to cure the ailments of livestock as ethnoveterinary medicine. In Chitrakoot of Satna (M.P.), tribal communities rear livestock mostly cattle, buffalo, goats, sheep etc. Most of the time animal diseases are treated by the use of local medicines extracted from the different part of the plant. Plant species used to treat different veterinary diseases like injury, poisoning foot and mouth, wounds, stomach disorder, ant worms and bone fracture of animals (Gautam and Ricchariya, 2015). Rajasthan has rich ethnoveterinary health traditions that are the products of decades of experience. The research work carried out in Rajasthan which deals with the traditional ethnoveterinary practices and its applications (Yadav *et al.* 2012). A total of 126 disease conditions/symptoms in Maharashtra and 61 disease conditions in Andhra Pradesh affecting livestock (large ruminants, small ruminants, camels, donkeys, pigs, and poultry) were documented. A total of 1,223 treatments in Maharashtra and 1,186 treatments in Andhra Pradesh were documented (Anonymous, 2004).
- **Significance of the study:** In recent years, the cost of conventional medicines for use in animals has increased and thus they have become unaffordable to most livestock raisers (Njoroge & Bussmann, 2006). Traditional remedies and practices, the ethno-veterinary medicines (EVMs), are now sometimes the only available alternative to expensive or unavailable modern forms of health care (Luseba & Merwe, 2006). The World Health Organization (Kiringe, 2006) attributed the popular use of traditional medicine among rural communities to it being affordable, readily accessible and culturally acceptable. In veterinary sector, this documentation of data may help in production of vaccines by the introduction of new technology which is inexpensive and affordable for livestock owners (Mir, 2014). Ethnoveterinary Medicine system widely practiced in rural areas where modern health care services are limited and even in areas where conventional veterinary service is available. It is deep rooted and rational practice for rural communities that can contribute better to animal health management. Therefore, use

of plants in ethnoveterinary practice has proved itself to be a potential resource for the community based animal health care activities throughout the world.

6. PROPOSED WORK PLAN / FORMULATION AND STRUCTURE OF STUDY: (Year wise plan of work and targets to be achieved)

Present research will be carried out in three years. Year wise plan of this work is as follows:

- **First year:** Extensive field survey will be done to document the knowledge of ethnoveterinary medicinal plants used by farmers, livestock owners and tribal of Nanded district. Literature survey will be done to choose plants species for further study having very little or no information about their phytochemical properties. Collection of the selected plant species from the fields. Preparation of the plant material for analysis.
- **Second year:** Field survey or documentation of ethnoveterinary plants**.** Phytochemical studies of selected ethnoveterinary plant species include qualitative estimation of bioactive molecules. Ash analysis includes ash values, qualitative analysis and quantitative estimation of minerals.
- **Third year:** Evaluation of antimicrobial activity. Preparation of final synopsis and thesis writing.

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